Land Use Change in Canada

Vancouver Urban-centred Region 1976-1982

Lands Directorate

Fact Sheet 85-5

Canada Land Use Monitoring Program

The Canada Land Use Monitoring Program (CLUMP) was established in 1978 by the Lands Directorate of Environment Canada to equip researchers, planners, land resource managers and policy makers with a more adequate land-use change information base. The Program complements the land capability surveys of the Canada Land Inventory.

Designed to monitor, both spatially and sequentially, land use and land-use change in various areas of Canada, CLUMP:

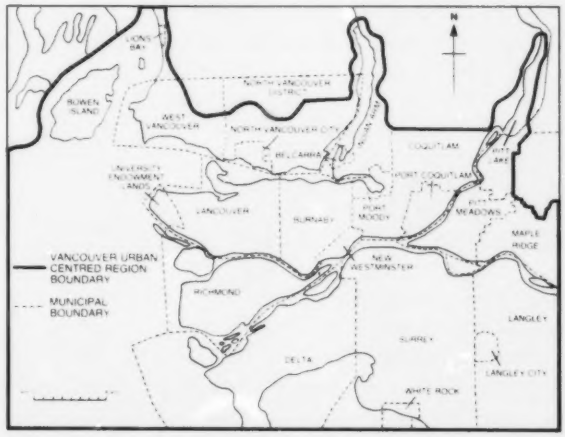
- provides improved awareness of the state of the land resource;
- identifies land-use trends of national and regional importance;
- determines major areas of rapid change which can potentially create land-use problems;
- analyses land-use change in terms of causes and consequences, particularly with respect to the impact of government policies and programs.

Four major components of CLUMP are: urban-centred regions, prime resource lands, rural areas and wildlands. The urban-centred region component examines land use in the rural-urban fringe of urban centres with populations of over 25 000. Data will be presented in fact sheets such as this for each urban centre with a population of 100 000 or more in 1981.

Highlights

- The Vancouver urban-centred region (UCR) encompasses 180 065 hectares (ha) and has an estimated population of 1.2 million people.
- In 1982, four major land uses occupied 86% of the study area: urban undifferentiated (28%), agriculture (24%), unused (22%), and recreation and conservation (12%).
- Built-up uses (urban undifferentiated, dwelling and other urban activities) occupied about 39% of the study area in 1982.
- Between 1976 and 1982, 7 345 ha of land (4% of the study area) became built-up.
- About 19% of the land that became built-up between 1976 and 1982 had high capability for agriculture (CLI Classes 1-3); 59% was in the lower agricultural capability classes (CLI Classes 4-6).
- High agricultural capability land (CLI Classes 1-3) occupies about 14% of the study area.

Vancouver Urban-centred Region



Environment Canada
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Canada

The CLUMP Process

Land-use data for the Vancouver UCR were compiled primarily from interpretation of 1982 black and white aerial photographs. The majority of the air photos were at a scale of 1:25 000. However, the air photos covering the very northern portion of the study area were at a 1:60 000 scale. Interpretation of these air photos was conducted using the CLUMP land activity/cover classification system. The classification is comprised of two components: land activity, which describes the active use made of the land; and land cover, which describes the vegetational or artificial construction covering the land surface. Field checks were made to verify air photo interpretation and fill data gaps.

The land use information on the interpreted air photos was subsequently transferred to stable base maps at the 1:50 000 scale. The maps were then scribed, digitized and entered into the computerized map storage and retrieval system of the Canada Land Data Systems (CLDS) of the Lands Directorate. This computerized mapping system made it possible to merge adjacent maps and overlay other themes such as shoreline and agricultural capability. The CLDS allows the researcher to analyse graphic and statistical data interactively for the production of tables, maps and reports.

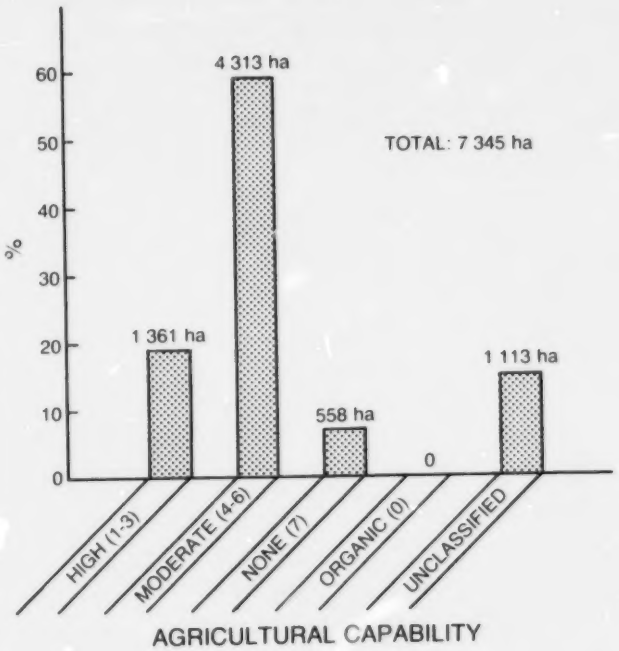
Land-use Change Since 1976

Land-use change information can indicate how much rural land in the Vancouver UCR became built-up (urban undifferentiated, dwelling and other urban activities) between 1976 and 1982. The 1982 land-use information was collected using a different classification from that used to record land-use information for the study area in 1967-71-76. Consequently, only general comparisons can be made between the 1982 information and that previously reported. During the 1976-1982 period, built-up uses (urban undifferentiated, dwelling, other urban) increased by 7 345 ha to a total of 70 571 ha. This represents an annual rate of change of 1 224 ha of land to built-up, a marked decline from the 2 095 ha annual rate of land-use change to built-up between 1971 and 1976.

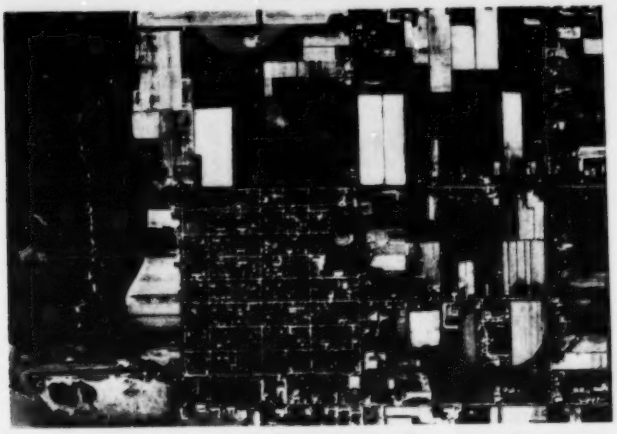
Land use in 1966, 1976 and 1982 in a portion of the study area is illustrated on the following page. The air photos depict an area of Richmond municipality, where land use has changed from mixed agricultural-residential in 1966 to built-up (classified as urban undifferentiated) in 1982.

The following histogram shows the Canada Land Inventory (CLI) agricultural capability of land that became built-up between 1976 and 1982. About 19% was in the high agricultural capability classes (1,2,3). The largest proportion (59%) was in the moderate agricultural capability classes (4,5,6).

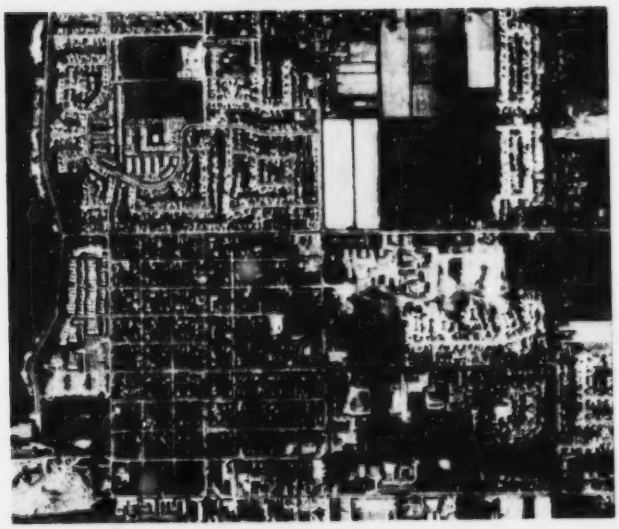
CLI AGRICULTURAL CAPABILITY OF LAND CONVERTED TO BUILT-UP 1976-1982



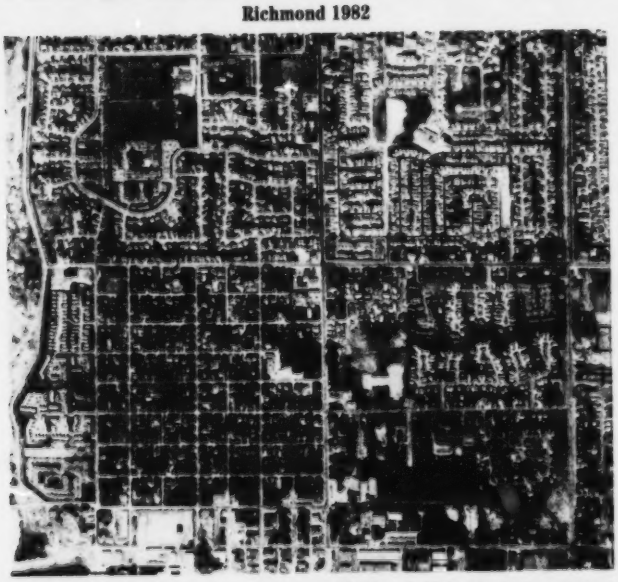
Richmond 1966



Richmond 1976



Richmond 1982



1966 air photo courtesy B.C. government; 1976 and 1982 air photos courtesy National Air Photo Library, Ottawa.

Land Use in 1982

The 180 065 ha of the Vancouver UCR have been grouped into nine major land uses: urban undifferentiated (28%), agriculture (24%), unused (22%), recreation and conservation (12%), dwelling (7%), other urban (4%), extraction (1%), land in transition (1%), and forestry (1%).

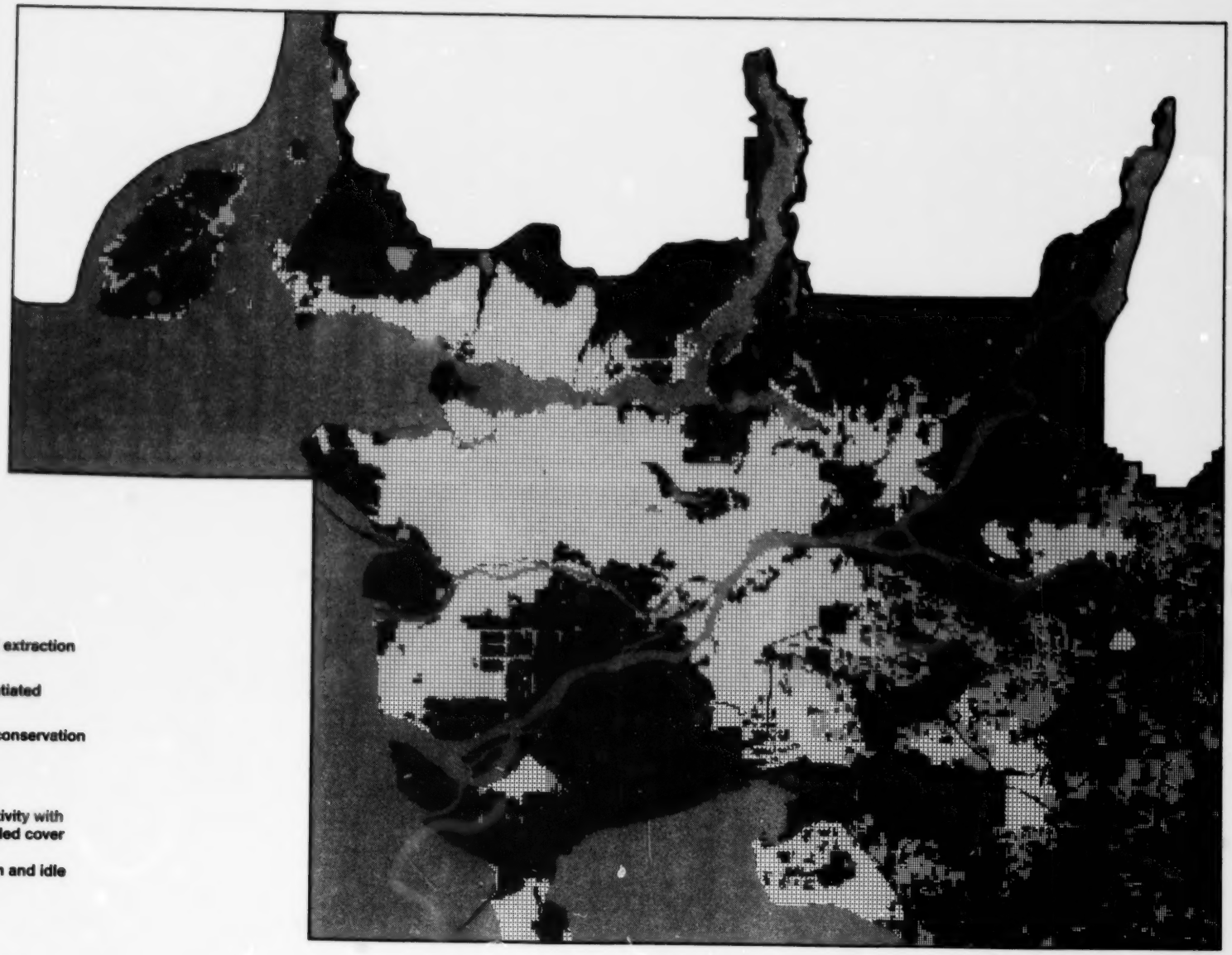
Urban undifferentiated is the concentrated built-up portion of the study area, including the urban core. In 1982, land uses in this category occupied 50 285 ha.

Agricultural activities occupied 42 506 ha. Growing annual tillage crops, forage crops and grazing on improved cover made up about 83% of this total. These activities are located primarily in the southern and eastern part of the area (Richmond, Delta, Surrey, Langley). Grazing on unimproved cover was scattered throughout the study area and occupied 3 144 ha. Fruit, berry and nut production occupied 2 131 ha. Virtually all (99%) of this total was in berries: raspberries, strawberries, blueberries and cranberries. Other agricultural activities using land productively, which includes land in nurseries and sod production, occupied 597 ha. These activities tend to be scattered throughout the study area. Site agriculture activities, including cattle and poultry barns as well as greenhouses, occupied 1 516 ha. Most site agriculture activities are located in the southern and eastern parts of the study area (Delta, Surrey, Langley, Pitt Meadows, Maple Ridge).

A total of 39 245 ha of land was classified as unused. Most (94%) of this unused land had no perceived activity and was covered with woody vegetation, reflecting the extensive forest land in the mountainous northern portion of the study area, and the numerous small tracts of wooded land scattered throughout the eastern portion of the UCR. The remainder of the unused area was classified as idle land, that is, land where there is no present activity, but where past activity is apparent (e.g., abandoned farm land). In 1982, idle land occupied 2 354 ha.

Recreation and conservation activities, which include land-dependent recreation, conservation and drainage, wildlife and fisheries related activities, occupied 22 685 ha. Land-dependent recreation activities (e.g., golf courses, ski slopes, parks) comprised 76% of this total. The extensive area in parks such as Cypress and Mount Seymour provincial parks and Campbell Valley and Minnekhada regional parks make up a large part of this land-use category. Conservation and drainage,

VANCOUVER URBAN–CENTRED REGION LAND USE 1982



N

0 10 Km

1:336,600

- Agriculture
- Dwelling
- Other urban and extraction
- Urban undifferentiated
- Recreation and conservation
- Forestry
- No perceived activity with dominantly wooded cover
- Land in transition and idle

Source: AGRI GLOS

Environment Canada

Environnement Canada

Land use in 1982

	Hectares		%
Urban Undifferentiated[1]		50 285	**28**
Agriculture		42 506	**24**
Productive-Land Agricultural Activities	40 990		
Annual tillage crops, forage crops and grazing on improved cover	35 118		
Grazing on unimproved cover	3 144		
Fruit, nuts and berries	2 131		
Other productive-land agricultural activities	597		
Site Agriculture	1 516		
Unused		39 245	**22**
No perceived activity	36 891		
Idle	2 354		
Recreation and Conservation		22 685	**12**
Land-dependent recreation	17 212		
Conservation and drainage, wildlife and fisheries related activities	5 473		
Dwelling (Residential)		12 504	**7**
High Density[2]	10 842		
Low Density[3]	1 662		
Other Urban		7 782	**4**
Transportation and communication	3 467		
Commercial, manufacturing and storing	2 594		
Institutional	932		
Recreation and cultural sites[4]	789		
Extraction		1 956	**1**
Land in Transition		1 772	**1**
Forestry		1 330	**1**
Total Study Area		180 065	**100**

Notes: [1] Urban undifferentiated is the concentrated built-up portion of the study including the urban core.
[2] Areas of high-density dwellings have a predominantly constructed cover.
[3] Areas of low-density dwellings have a predominant cover of grass, shrubs or trees.
[4] Site recreation areas have a predominantly constructed cover.

wildlife and fisheries related activities reflect areas used for wildlife protection such as Reifel Refuge at the mouth of the Fraser River, the Greater Vancouver Water District water supply area in the northern portion of the study area and the dyked Alouette and North Alouette rivers in the northeast portion of the study area. These activities comprise about 5 473 ha.

Dwelling activities in 1982 totalled 12 504 ha or 7% of the study area and were concentrated in Surrey, Langley and Maple Ridge municipalities. Approximately 87% was classed as high-density dwelling activities, distinguished on the basis of predominantly constructed cover. Low-density dwelling activities have a primarily grass or wooded cover and are usually large residential estates or hobby farms. They occupy 1 662 ha or 13% of the area classed as dwelling. This figure underestimates the amount of low-density dwelling activity because many of the very large residential estates and hobby farms were classed as agriculture rather than as dwelling activities.

Outside of the urban undifferentiated area, other urban activities in 1982 occupied 7 782 ha of land in the UCR, or about 4% of the study area. Transportation and communication activities, mainly roads, airports and electrical transmission lines, made up 45% of this total. One-third of the other urban activities were commercial, manufacturing and storing, while 12% was institutional (e.g., schools, churches) and 10% was in recreation and cultural site activities (e.g., rifle ranges and fair grounds).

Three activities each occupied about 1% of the study area: extraction, land in transition and forestry. A total of 1 956 ha were in extraction. This includes sand and gravel pits as well as the large peat extraction areas in Delta. Land in transition includes all land on which there is evidence of active disturbance that suggests some future use or activity on the land. In 1982, a total of 1 772 ha were classed as land in transition. Forestry activities occupied 1 330 ha in the study area.

The CLI soil capability for agriculture ratings in the Vancouver UCR are summarized in the following tables. About 14% of the study area is rated high capability agricultural land (CLI Classes 1,2,3). Sixty-five percent of this land was used for agriculture in 1982.

Land rated as having moderate capability for agriculture (CLI Classes 4,5,6) occupies 31% of the UCR. In 1982, one-third of this land was used for agriculture, while 23% was unused. Seventeen percent of the land in the study area is rated as having no capability for cultivated crops or permanent pasture. Almost one-half (47%) of this land was unused and 39% was used for recreation and conservation. The majority of this land is the mountainous northern portion of the study area.

Organic soils occupy 8% of the UCR. In 1982, 42% of these organic soils were used for agriculture and 32% were unused. Almost one-third (30%) of the land in the study area was not classified for its agricultural capability. This unmapped or unclassified land generally corresponds to the built-up area at the time the capability classification was completed.

Canada Land Inventory
soil capability for agriculture

	Class	Area (ha)
High	1	1 924
Capability	2	8 486
	3	15 361
		25 771
Moderate	4	29 908
Capability	5	21 989
	6	4 035
		55 932
No Capability	7	29 899
Organic	0	14 243
Unclassified	8	54 220
		180 065

Use of land and its capability for agriculture
(Hectares)

Land Use \ CLI Class	High 1-3	Moderate 4-6	None 7	Organic O	Unclassified	Total
Urban Undifferentiated	1 646	7 611	1 064	233	39 731	50 285
Agriculture	16 739	18 521	203	5 923	1 120	42 506
Unused	2 682	12 727	14 183	4 533	5 120	39 245
Recreation and Conservation	991	5 415	11 689	1 069	3 521	22 685
Dwelling - high density	1 650	7 405	706	215	866	10 842
- low density	349	806	370	25	112	1 662
Other Urban	1 247	2 175	876	657	2 827	7 782
Extraction	50	358	187	1 350	11	1 956
Land in Transition	377	498	42	216	639	1 772
Forestry	40	416	579	22	273	1 330
TOTAL	25 771	55 932	29 899	14 243	54 220	180 065

Trends and Future Directions

Between 1976 and 1982, most of the land that became built-up (59%) was in the lower agricultural capability classes (CLI Classes 4-6). However, 19% of the converted land had high capability for agriculture (CLI Classes 1-3).

The loss of high-quality agricultural land to urbanization is a nation-wide concern. Guidelines of the Federal Policy on Land Use endorse the principle of minimizing the conversion of high agricultural capability lands to uses incompatible with long-term food production.

Concerns about urban sprawl and the desire to protect prime agricultural land for agricultural purposes, especially in areas such as the lower Fraser Valley where the problem has been acute, led to the establishment in 1973 of the provincial Agricultural Land Reserves and the Agricultural Land Commission. Agricultural land not protected by Agricultural Land Reserves could be expected to be developed for other uses over time.

The updated plan for the Lower Mainland of British Columbia (1980), which includes all of the Vancouver UCR, is a revision of the Official Regional Plan enacted in 1966. As a general policy, the updated plan supports the preservation and enhancement of farmland and encourages "non-soil bound agriculture" to be located on lower capability land. All lands within the Agricultural Land Reserve are designated as agricultural in this plan. The plan also identifies land for urban expansion. The strategy outlined in this updated plan is to concentrate additional growth within the metropolitan area and existing Fraser Valley towns; locate more of the growth in the Fraser Valley on the north side of the Fraser River; and encourage further development to make efficient use of transportation, water and sewage facilities.

Future monitoring studies such as this one will be able to determine the success of these plans in directing urban growth away from prime agricultural areas in the Vancouver UCR.

A contrast in land uses: the northeastern part of the Vancouver UCR.

1982 air photo courtesy B.C. government.

Résumé

Le présent feuillet est consacré à l'utilisation des terres dans la région de Vancouver, à leur potentiel ainsi qu'aux récents changements intervenus dans leur utilisation. L'étude, qui a été réalisée dans le cadre du Programme de surveillance de l'utilisation des terres au Canada, avait pour but de déterminer la superficie des terres par catégorie d'utilisation ainsi que leur localisation en 1982, leur potentiel agricole, de même que la superficie et le potentiel des terres qui ont été urbanisées entre 1976 et 1982. Pour de plus amples renseignements, écrire à l'adresse qui apparaît ci-contre.

For Further Information

Fact sheets for other UCRs are being produced, together with a national fact sheet that will summarize rural to urban land conversion data for all UCRs. Digital data are permanently on file with the Canada Land Data Systems and are accessible for analyses on a cost-recovery basis. For further information on CLUMP and the data sets, contact the address listed below.

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